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Personal Computers in the Light Infantry: A Survey on Office and Home Computers

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14. ABSTRACT *(Maximum 200 words)*:

Computers with certain minimum hardware requirements are needed to perform information management functions and computer-based training (CBT). The purpose of this study was to determine the availability and features of computers for use by battle staffs. A survey was designed to obtain this information from Light Infantry brigades. The results from fourteen brigades indicated that variations in computer features existed. Further information was obtained by making the survey available to battalion and brigade units training at the Leaders Training Program at the Joint Readiness Training Center. A total of thirty-six units completed the survey. About half of the available computers were Pentiums with most of the remaining being 486s. Many of the computers lacking the necessary features could be inexpensively upgraded. It was concluded that CBT courseware developers should consider the target audience's hardware capabilities for running the software.

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PERSONAL COMPUTERS IN THE LIGHT INFANTRY:
A SURVEY ON OFFICE AND HOME COMPUTERS

EXECUTIVE SUMMARY

Requirement:

The U. S. Army has committed to using distributed training concepts to insure that unit personnel remain well trained despite reduced training time and resources. Computer-based training has been identified as one training vehicle that can be used to meet these demands. One major requirement for using computer-based instruction is that students have access to computers powerful enough to run the training software. The purpose of this survey was to determine the availability of computers to the primary staff officers of Light Infantry units.

Procedure:

A ten-item survey was developed to determine the availability and features of computers in Light Infantry brigades. An initial survey was administered to sixteen Light Infantry Brigades, ten active duty, and six National Guard/Reserve units. Additional information was gathered by administering the same survey to thirty-six battalion and brigade task forces training at the Leaders Training Program (LTP) at the Joint Readiness Training Center.

Findings:

The survey results were summarized by staff position to show both availability and features of computers. Although most staff officers from the initial survey had an office computer, the features of the available computers varied somewhat. For example, 17% of the officers had Pentium computers. Variations of computer features existed both within and across units. Within the LTP sample, about half of the officers had Pentium computers and most of the remaining computers were 486s. Of the 486s, some did not have sufficient speed and memory to meet current software demands. Most of the computers in the LTP sample had CDROM and sound with 69% having CDROM and 62% having sound capabilities. There were not enough data on availability of home computers to draw valid conclusions.

Utilization of Findings:

Some of the computers currently available to staff members would have difficulty running current software. Of these computers, simple and inexpensive upgrades of memory, CDROM, and sound would allow the computers to be used for computer-based training. Training courseware developers should consider the impact of the hardware requirements on the ability of units to conduct the training.

PERSONAL COMPUTERS IN THE LIGHT INFANTRY:
A SURVEY ON OFFICE AND HOME COMPUTERS

CONTENTS

LIST OF TABLES

Personal Computers in the Light Infantry: A Survey on Office and Home Computers

Background

The Army's distance learning plan includes computer-based training (CBT) as an important component of the Total Army School System (WARNET Pilot Team, 1996). CBT using CDROM (Compact Disk Read Only Memory) technology can be used to distribute distance learning training. In addition to being exportable, CBT will enable course instruction to become standardized.

CBT courseware using CDROM technology requires computers with certain minimum capabilities. For example, training developed under contract by BDM, Federal, Inc., for the Army Research Institute (ARI) Infantry Forces Research Unit, requires at least a 486 66 MHz (megahertz) multi-media computer with 16 MB (megabyte) RAM (Random Access Memory) running in a Windows environment (Andre & Salter, 1996). However, a review of documentation calling for increased development of CBT (e.g., Pleban, Brown, & Martin, 1997; WARNET Pilot Team, 1996), shows that the issue of whether units have the computer capability to run the training is not being addressed.

Besides training, computers can be used as tools for managing increasing amounts of information. The Tactical Operations Center of a unit provides information to assist the commander in command and control of the unit (Mc Williams, 1997). Because personal computers can be used to store, manage, and disseminate information with efficiency, unit staff members will begin to rely more on computers to assist them in information management. In order to obtain the greatest benefit from personal computers, staff members should have access to and be trained on computer use. This access should include both office and home computers.

Purpose

What is still unknown is whether or not units actually have computers with the capabilities to deliver CBT or to be used for information management. The purpose of this survey was to determine the availability and capabilities of personal computers for use by the primary staff within the brigade. It was thought that this information would be useful not only for ascertaining computer availability for training purposes, but also for information management. The impetus behind conducting this survey was the development of computer-based instruction designed to provide staff members with functional area skills. This training was developed, in part, as a result of documented research supporting the need for staff officer training (Thompson, Thompson, Pleban, & Valentine, 1991).

Additional training has been developed more recently to train staff members in the Military Decision-Making Process (MDMP). MDMP has been cited as a staff weakness during the stress of a combat mission at the Joint Readiness Training Center (JRTC) (CALL CTC Trends, 1997). Coaches at the Leaders Training Program (LTP) at the JRTC have also indicated that staffs require additional training and practice on MDMP. Therefore, the MDMP training was developed to provide units home station training prior to LTP attendance. It provides instruction on the doctrinal aspects of MDMP as well as tactics, techniques, and procedures

associated with each staff section. The training requires access to a multi-media computer running Windows 95. Because computer availability is unknown, an empirical test is needed to determine staffs' needs and capabilities.

Survey

The survey consisted of a ten item self-administered questionnaire. The selected sample consisted of sixteen units, ten active duty Light Infantry units and six National Guard/Reserve Light Infantry units. Telephone calls were made to the brigade S-3's to coordinate distribution of the surveys. The material was faxed to the units and the results mailed back to ARI.

The survey consisted of fill in the blank questions to identify which brigade staff members had computers, whether they had computers at home, the type of computer, and certain features about the computer. Other questions asked about the availability and type of computers at the post learning center and the brigade learning center to determine whether additional sources besides office and home existed. A copy of the survey can be found in Appendix A.

The primary focus of the survey was to collect information about eight brigade positions; Commander (CDR); Executive Officer (XO); S1 (Personnel); S2 (Intelligence); S3 (Operations); S4 (Logistics); S5 (Civil Affairs); and the FSO (Fire Support Officer). For each staff member, the items asked whether they had a computer either at home or at the office. If they had a computer at either location, they were asked to describe it. The descriptions included: type computer (e.g., IBM compatible), the Central Processing Unit (CPU) speed, System RAM, availability of CDROM, and sound capabilities.

Survey Results and Findings

Phase I: Initial Survey

The questionnaire was faxed to the sixteen units. An Orientation Paper and an Information Paper explaining the purpose of the survey were faxed along with the questionnaire. All units were called to ensure receipt of the survey and to answer any questions. Results are based on fourteen units that returned the surveys. Several weeks after receipt of the completed surveys, calls were made to some of the units for verification of the information. All information checked was verified. It was concluded that information received in the survey was correct.

The survey responses were first summarized to show how many computers were available by staff position. Table 1 shows computer availability for each staff position. The first number in each cell refers to the number of available computers. The second number in each cell refers to the number of responses. For example, there were nine computers available to the nine commanders responding to the survey. As can be seen, all but one staff member (one S5) responding to the survey had access to an office computer. We do not know how many of the staff members not responding to the survey had access to computers. However, we can probably assume that most have access to computers because most of those responding have computers. There were fewer responses to the home computer availability question, but only two of the respondents indicated that they did not have access to a home computer.

Table 1

Computer Availability of Office and Home Computers by Staff Positions

STAFF POSITIONS

	CDR	XO	S1	S2	S3	S4	S5	FSO
Office Computers	9/9	9/9	14/14	10/10	14/14	14/14	1/2	6/6
Home Computers	3/3	4/4	2/2	3/3	4/5	4/4	0/1	3/3

Note. Fourteen units returned the surveys. Only completed items are included in the table.

The next issue examined was compatibility. All staff members responding to the survey indicated that the available computers were IBM compatible. Only one home computer was not IBM compatible. Table 2 provides detailed information by staff position about the accessories of the available computers. Examination of Table 2 reveals that there is considerable variation in the capabilities of the available computers. For example, the CPU ranged from 286 to Pentium with processing speeds ranging from below 33MHz up to 166MHz. However, the majority of available computers were Pentiums and 486s.

The variation of computer features raises important questions as to how useful these computers would be for information management and CBT. A number of the reported computers would have difficulty running the very latest software. This may have implications for units trying to manage battlefield information (e.g., digital terrain, graphic overlays, and target information). Also of concern is that the variation existed within units, indicating likely problems in transferring information from one staff section to another.

These results show that a number of staff members do not have computers with the latest technology and features. With increasing demands for digital battlefield requirements and distance learning requirements, staff members must have access to the most powerful up to date computers. However, based on these results, several staff members are using either outdated or obsolete computers. The minimum requirements for running many multi-media functions for computer-based training are 486/66, 16 MB RAM, CDROM, and sound card. Because the first priority for computer use should be for mission essential tasks, the number of computers available with the minimum features for computer-based training may be very limited. These limitations can be offset by use of home computers for training functions. The results of this survey did not provide the information necessary to determine the availability of home computers for computer-based training.

The items asking about computer availability at the post or brigade learning centers did little to reveal computer availability for training purposes. Only four of the units responded "yes" that the post had a learning center with computers and none responded that the brigade had a learning center. No conclusions can be made because the items were for the most part left blank.

Table 2

Summary of Computer capabilities of Office Computers by Staff Positions

	STAFF POSITIONS							
	CDR	XO	S1	S2	S3	S4	S5	FSO
CPU								
Pentium	1	1	2	4	2	3	0	0
486	7	7	10	4	9	7	0	6
386	1	1	1	2	2	2	1	0
286	0	0	1	0	1	2	0	0
Speed (MHz)								
≥ 66	6	9	8	7	6	6	0	5
≤ 33	2	1	5	1	5	2	0	1
?	1	1	1	2	3	6	1	0
RAM (MB)								
≥ 16	6	6	8	7	7	6	0	4
≤ 8	2	2	4	2	6	6	1	2
?	1	1	2	1	1	2	0	0
CDROM								
Yes	3	4	5	4	5	7	0	1
No	6	5	9	6	8	6	1	4
?	0	0	0	0	1	1	0	1
Sound								
Yes	6	4	6	4	6	6	0	2
No	3	5	8	6	7	5	1	4
?	0	0	0	0	1	3	0	0

Note. A question mark indicates that the information on the particular feature was left blank on the survey form.

Phase II: Secondary Survey

After examination of the available data from this study, it was determined that not enough information existed to draw useful conclusions. Much of the problem stemmed from lack of response on many of the items. Because almost all of those who did respond indicated availability of computers at the offices, it is safe to conclude that most of those who did not respond had computers available. However, the wide variation of features raised questions about the utility of the available computers.

A decision was made to have the survey filled out by units rotating through the LTP at JRTC. The same survey used for the previous sample was provided to battalion and brigade units training at the LTP. Survey information was collected from March 1997 through October 1997. Thirty-six units completed the survey. The results of this information are summarized below by staff position, excluding the S5 and FSO positions.

Table 3

Summary of Computer capabilities of Office Computers by Staff Positions for Units Training at LTP

	STAFF POSITIONS					
	CDR	XO	S1	S2	S3	S4
CPU						
Pentium	13	13	14	23	24	14
486	19	20	16	11	11	17
386	3	2	2	0	0	1
Speed (MHz)						
≥ 66	17	19	17	23	25	17
≤ 33	3	4	2	0	1	2
?	14	12	13	11	9	13
RAM (MB)						
≥ 16	16	18	16	21	22	17
≤ 8	7	8	8	4	4	6
?	13	9	8	9	9	9
CDROM						
Yes	18	17	22	25	24	24
No	15	17	7	7	8	5
?	2	1	3	2	3	3
Sound						
Yes	19	18	13	21	19	13
No	11	14	10	9	11	7
?	5	3	9	4	5	12

Note. Only positive responses to computer availability are included in the table. A question mark indicates that the information on the particular feature was left blank on the survey form.

There were a few non-responses and only one negative response to the computer availability question. Examination of Table 3 reveals that the computer features appear to be of higher quality than that of the original sample. For example, in the original sample, only 17% of the computers had a Pentium processor. Half of the computers had Pentium processors in the LTP sample. One reason could be that the LTP sample was taken as much as nine months later than the original sample. This is encouraging, indicating that units may be upgrading their outdated computers.

Computer capabilities with CDROM and sound available are important for delivering CBT. Sixty-nine percent of the computers had CDROM and sixty-two percent had sound. The number of computers able to conduct CBT could be increased with inexpensive upgrades since over 90% of the computers had at least a 486 CPU.

Conclusions

In both samples, there were variations in computer features. Although the LTP sample appeared to have higher quality features, CPU speed ranged from below 33 MHz up to 233 MHz. With increasing demands to process digital information in both peacetime and wartime, a number of the reported computers would have difficulty performing functions required. The variation in computer features exists both within and across units. Thus, units may likely over task the up-to-date computers, creating a backlog of functions waiting to be performed. In addition, sharing of information may be difficult because many of the reported computers would be running earlier versions of the required software.

The MDMP and other CBT requires CDROM and sound in addition to sufficient RAM and speed. Based on speed and RAM, as many as 75% of the computers would be able to run the MDMP courseware. However, based on CDROM and sound capabilities, the number of computers able to run the courseware falls to below 70%. With additional training being developed using computers as the distance learning vehicle, staff members must have access to up-to-date computers in the office. Many of the reported computers could be easily upgraded with the required RAM, CDROM, and sound relatively inexpensively.

The likelihood of units making the reported computers available for training purposes is not known. However, computers with the most up-to-date features would probably be allocated for mission essential tasks. Therefore, the availability of home computers with multi-media capabilities is an important consideration for successful CBT. Unfortunately, there were not enough survey responses to draw conclusions about home computer availability.

The majority of the available computers have the capability to run current CBT. Additional computers could be upgraded inexpensively to increase these numbers. Personnel involved in future development of CBT should consider the impact of the hardware requirements to deliver the training. Questions in the future should go beyond the total number of computers with sufficient features. More specifically, inquiries should address the number of computers and the amount of time the computers could be used for CBT purposes.

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Appendix A

Survey Form

Personal Computer Data Worksheet

Unit: _____
POC: _____

Items:	Type	CPU/Speed	SYS RAM	CDROM	Sound
Example:	IBM Compatible	486 66	20 MB	Yes	Yes

No names are required

CDR:
Home: _____
CDR:
Office _____

XO:
Home: _____
XO:
Office _____

S1:
Home: _____
S1:
Office _____

S2:
Home: _____
S2:
Office _____

S3:
Home: _____
S3:
Office _____

S4:
Home: _____
S4:
Office _____

S5:
Home: _____
S5:
Office _____

FSO:
Home: _____
FSO:
Office _____

Does the post have a learning center with PCs available? In general, what type?
Does your Brigade have a learning center with PCs available? In general, what type?